UNITED STATES PATENT AND TRADEMARK OFFICE

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Ex parte HANS DAVID HOEG, ERIC LAWRENCE HALE,
and NATHAN JON SCHARA

Appeal 2007-2314
Application 10/657,110
Technology Center 3700

Decided: September 6, 2007

Before DONALD E. ADAMS, ERIC GRIMES, and LORA M. GREEN,
Administrative Patent Judges.

GRIMES, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 involving claims to a method involving a variable-direction-of-view endoscope. The Examiner has rejected the claims as obvious. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

BACKGROUND

The Specification describes a "method for improving a diagnostic or surgical procedure involving a variable direction of view endoscope with a variable line of sight" (Specification 6). The method comprises:

> acquiring volumetric scan data of a subsurface structure; positioning said endoscope relative to said subsurface structure; establishing the position of said endoscope relative to said subsurface structure; acquiring internal endoscope configuration data; displaying representations of said subsurface structure and said endoscopic line of sight in their correct relative spatial relationship based on said volumetric scan data, said endoscope position data, and said internal endoscope configuration data.

(*Id.*)

DISCUSSION

1. CLAIMS

Claims 9-13 are pending and on appeal. The claims have not been argued separately and therefore stand or fall together. 37 C.F.R. § 41.37(c)(1)(vii). We will focus on claim 9, the broadest claim on appeal, which reads as follows:

9. A method for improving a diagnostic or surgical procedure involving a variable direction of view endoscope with a variable line of sight comprising:

acquiring volumetric scan data of a subsurface structure;

positioning said endoscope relative to said subsurface structure;

acquiring configuration data of an internal view changing mechanism of the said endoscope;

establishing the position of said endoscope relative to said subsurface structure; and

based on said volumetric scan data, said endoscope position data, and said configuration data, displaying representations of said subsurface structure and said endoscopic line of sight in their correct relative spatial relationship.

2. PRIOR ART

The Examiner relies on the following references:

Chen	US 6,241,657	Jun. 5, 2001
Dohi	US 2002/0022767	Feb. 21, 2002

3. OBVIOUSNESS

Claims 9-13 stand rejected under 35 U.S.C. § 103 as obvious over Chen in view of Dohi. The Examiner relies on Chen for disclosing:

> a method for improving a diagnostic or surgical procedure . . . comprising: acquiring volumetric scan data of a subsurface structure . . . ; positioning [an] endoscope relative to said subsurface structure, . . . establishing the position of said endoscope relative to said subsurface structure . . . ; and based on said volumetric scan data . . . [and] said endoscope position data . . . , displaying representations of said subsurface structure and said endoscopic line of sight . . . in their correct relative spatial relationship.

(Answer 4-6.)

The Examiner relies on Dohi for disclosing an endoscope with an internal view changing mechanism (*id.* at 6-7). The Examiner concludes that it would have been obvious to use Chen's endoscope in Dohi's method (*id.* at 7). The Examiner finds that a "skilled artisan would be motivated to do so because Dohi's endoscope allows for '[provision of] various endoscope images in good quality without the movement or bending of an endoscope'" (*id.* (citing Dohi, ¶ 0008)).

We conclude that the Examiner has set forth a prima facie case of obviousness. Chen describes an

> anatomical visualization system comprising . . . a database of pre-existing software objects, wherein at least one of the software objects corresponds to a physical structure which is to be viewed by the system; a real-time sensor for acquiring data about the physical structure . . . ; generating means for generating a real-time software object corresponding to the physical structure, using data acquired by the sensor; registration means for positioning the real-time software object in registration with the pre-existing software objects contained in the database; and processing means for generating an image from the software objects contained in the database, based upon a specified point of view.

(Chen, col. 2, l. 56, to col. 3, l. 6.) The system "is intended to be used by a physician **20** to visually inspect anatomical objects **30** located at an interior anatomical site" (*id.* at col. 4, ll. 27-31).

Specifically, Chen describes a system containing "endoscope means **40**, endoscope tracking means **50**, computer means **60**, database means **70** containing 3-D computer models of various objects which are to be visualized by the system, and display means **80**" (*id.* at col. 4, ll. 41-45). Endoscope means 40 comprises an endoscope 90 (*id.* at col. 4, ll. 47-48). The endoscope tracking means may comprise a tracking system attached to endoscope 90 that generates output signals "representative of the spatial positioning and orientation of endoscope **90**" (*id.* at col. 5, ll. 3-17).

The anatomical 3-D computer models "are preferably structured as a collection of software objects . . . created, for example, through post-processing of CT or MRI scans of the patient" (*id.* at col. 6, ll. 4-17). The 3-D computer models representing the endoscope comprise both a software

object representative of the endoscope shaft and a software object representative of the video image acquired by the endoscope (*id.* at col. 7, ll. 36-44). The various software objects of the anatomical 3-D computer models and of the endoscope 3-D computer models are merged "into a single composition image combining both live video images derived from endoscope **90** with computer generated images derived from the computer graphics system" (*id.* at col. 8, ll. 36-45).

Dohi describes an endoscope having a prism "and an actuator to drive the prism on a given command signal, whereby a different endoscope image is obtained through the movement of the prism" (Dohi, ¶ 0009). Dohi describes an actuator including motors 7 and 8, the motor driving amount being detected by rotary encoders 9 and 10 (*id.* at ¶ 0023). A prism position-detecting part detects prism movement "based on the driving amounts of the motors **7** and **8** detected by the rotary encoders **9** and **10**" (*id.* at ¶ 0024). We agree with the Examiner that it would have been obvious to use Dohi's variable-direction-of-view endoscope in the system described in Chen in order to provide "various endoscope images in good quality without the movement or bending of an endoscope" (Answer 7), and that the combined references suggest the method of claim 9.

Appellants argue that "there is no suggestion in the prior art to make the combination necessary to arrive at [the] invention recited in claim 9" (Br. 5). In particular, Appellants argue that the Examiner's rationale "is simply a reason why an internal view changing mechanism is desirable" and "does not provide any suggestion to combine such a mechanism with a tracking system such as Chen's" (*id.* at 6).

We disagree. As admitted by Appellants, the Examiner provides a reason why an internal view changing mechanism is desirable, specifically that it provides "various endoscope images in good quality without the movement or bending of an endoscope" (Answer 7). As discussed above, we agree with the Examiner that this reason provides motivation to use Dohi's endoscope in the system described in Chen.

In addition, Appellants argue that "there is no basis for the assertion that the Chen design even *could* be modified in this way. It is unclear why [Chen's] tracking system 97 is allegedly able to receive and process signals from rotary encoders in [Dohi's] scope." (Br. 8.) "[T]here is certainly no teaching in the Chen reference of a tracking system that is operative to acquire configuration data of view changing mechanisms of the scope" (*id.*).

We are not persuaded by this argument. Instead, in the absence of any evidence to the contrary, we agree with the Examiner that "a skilled artisan would observe that the same signals which allow the 'prism position-detecting part 14' to detect the orientation of . . . Dohi's endoscope [can] be applied to Chen's 'tracking system 97' in order to determine the orientation of the endoscope" (Answer 11).

Appellants also argue that "both references specifically teach away [from] such a design change. Specifically, each of these references discusses the advantages of their forms of changing the direction of view *without* using the type of motion described in the other reference." (Br. 9.) In particular, Dohi "explains that the objective of the Dohi system is to acquire images of particular, focused areas *without moving or bending the scope*" (*id.*). In addition,

> Chen, which employs the tracking system 97 that tracks the position and orientation of the scope itself (i.e., pitch, roll), specifically describes the advantage of being able to consider the scope and field of view software objects 90A, 90B as a single unit when being positioned within the 3-D computer models by maintaining a fixed relationship between the two. . . . Accordingly, Chen actually suggests that it is undesirable to employ an internal view changing mechanism that would change the direction of view relative to the position of the scope itself.

(*Id.* at 9-10.)

> We are not persuaded by this argument.
>
> A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant. The degree of teaching away will of course depend on the particular facts; in general, a reference will teach away if it suggests that the line of development flowing from the reference's disclosure is unlikely to be productive of the result sought by the applicant.

In re Gurley, 27 F.3d 551, 553 (Fed. Cir. 1994). We do not agree that the teachings of Dohi and Chen pointed to by Appellants would have led in a direction divergent from the path taken by Appellants. As noted by Appellants, Dohi "explains that the objective of the Dohi system is to acquire images of particular, focused areas *without moving or bending the scope*" (Br. 9). Rather than teaching away from combining Dohi with Chen, we conclude that this teaching provides motivation to combine these references.

In addition, although Chen indicates that "it can sometimes be convenient to think of shaft software object **90**A' and disk software

object **90**B' as behaving like a single unit" (Chen col. 8, ll. 14-22), we do not agree that that this teaching is sufficient to teach away from combining Dohi with Chen. This teaching indicates that it is *sometimes convenient* if the optical characteristics of the endoscope remain constant (*id.* at col. 8, ll. 14-15). However, it does not suggest that using an endoscope with an internal view changing mechanism is unlikely to be productive.

Appellants also argue that "even if an internal view changing mechanism were incorporated into the Chen device, there is still no disclosure of 'acquiring configuration data' of such a view changing mechanism, and displaying representations of the subsurface structure and the endoscopic line of sight in their correct relative spatial relationship based on this configuration data" (Br. 10).

We are not persuaded by this argument. Chen describes a tracking system that generates output signals "representative of the spatial positioning and orientation of [the] endoscope" (Chen, col. 5, ll. 14-17). In addition, Chen describes using this data "for positioning [a] real-time software object in registration with . . . pre-existing software objects" (*id.* at col. 3, ll. 1-3). Although we agree with Appellants that Chen does not describe "acquiring configuration data of an internal view changing mechanism of [an] endoscope" and displaying representations of a subsurface structure based on these data, we conclude that, once the system of Chen is modified to include Dohi's endoscope, it would have been obvious to do so in order to correctly position the real-time software object in registration with the pre-existing software objects.

In addition, Appellants argue that "the Examiner appears to have mistakenly construed the trackable change in 'orientation,' which is described in Chen, as the same thing as a change in the configuration of an internal view changing mechanism (e.g., prism)" (Reply Br. 2). In contrast, Appellants argue that:

> The tracking system described in Chen is clearly a tracking system that simply tracks changes in the spatial position and orientation of the endoscope itself. In other words, the endoscope can change "position" by pivoting the scope left or right and/or pitching the scope up or down. Similarly, the orientation of the scope can change by rolling it about its longitudinal axis. Chen offers no disclosure of measuring anything other than changes in this spatial position/orientation of the scope.

(*Id.* at 3.)

As discussed above, we agree with Appellants that Chen does not describe "acquiring configuration data of an internal view changing mechanism of [an] endoscope" and displaying representations of a subsurface structure based on these data. However, for the reasons discussed above, we conclude that doing so would have been obvious. Therefore, even if the Examiner "mistakenly construed the trackable change in 'orientation,' which is described in Chen, as the same thing as a change in the configuration of an internal view changing mechanism (e.g., prism)," we are not persuaded that the combination of Chen and Dohi does not render claim 9 obvious.

SUMMARY

We conclude that the Examiner has set forth a prima facie case that claim 9 would have been obvious over Chen in view of Dohi, which

Appellants have not rebutted. We therefore affirm the rejection of claim 9 under 35 U.S.C. § 103. Claims 10-13 fall with claim 9.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

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ST. ONGE STEWARD JOHNSTON & REENS, LLC
986 BEDFORD STREET
STAMFORD CT 06905-5619